

What are the Benefits for my Physical Health?

Author: Cristina Ruscitto
BAINES SIMMONS



Sleep is the foundation of good health and relationships.

Sleep is the foundation of good health and relationships. Because good sleep powers alertness and decision making, and is key to our health and wellbeing, it is important for us all, but many of us do not obtain the sleep we need. There is a tendency in modern society to prioritise other needs above sleep, and we mistakenly think we can do without, or catch-up on sleep, without any long-term consequences. Reading this will help you understand the important role that regular good quality sleep plays in maintaining our physical health, and how you can assess your own sleep health.

Why is sleep important?

Sleep is a fundamental physiological need, like eating and drinking, and is essential to our physical and mental health. We spend about one-third of our lives asleep, 25 years or more for most people.

There are many reasons why we sleep, including:

- **Evolution:** The need to save energy and protect ourselves from danger at night, a time when we are most vulnerable.
- **Restoration:** Our body restores itself at such as growth hormone, and the regeneration of cells and tissue repair.
- **Memory processing:** While we sleep, we file what is important into memory and discard what is not important.
- **Emotional rebalancing:** Sleep recalibrates our emotions and is critical for emotional regulation during the day

What is sleep?

Contrary to what many people believe, sleep is not a passive state. Our brain is active during sleep, and different patterns of brain activity define what stage of sleep we are in.

There are two main states of sleep:

- Non-rapid eye movement (NREM), divided into stages of light sleep (about 55% of total sleep time) and deep sleep (about 20% of total sleep time).
- Rapid eye movement (REM) sleep, sometimes called dreaming sleep, accounts for 20–25% of total sleep time.

When we are asleep, we cycle between NREM and REM, usually moving from light sleep, to deep sleep, back to light sleep, and then into dreaming sleep, before finishing in light sleep. This cycle typically takes about 90 to 110 minutes, and usually occurs four to six times per night. All stages of sleep are important – light and deep sleep play a role in our memory, while dreaming sleep helps processing emotions and deleting unwanted information.

Can getting enough sleep help me to live longer?

Yes, we can live a longer and healthier life when we achieve the optimum amount of sleep we need. Research consistently shows that sleeping too little (less than six hours) and too much (nine hours or more) is associated with a shorter lifespan. Research has shown that there is a 12% increased risk in mortality in those who consistently sleep less than six hours. The increased risk exceeds 15% for those reporting less than 3.5 or 4.5 hours or more than 8.5 hours sleep^{1,2}.

Regularly sleeping too little or too long increases our vulnerability to illness over time. Research into sleep, shift work and jetlag show that inadequate sleep is associated with an increased risk of developing obesity, diabetes, cardiovascular disease, and mood disturbances (e.g. depression).

It is normal to occasionally or temporarily have inadequate sleep or sleep for a long period of time, due to work demands, family, financial problems or illness. We should not be alarmed. We should just be mindful that we are more vulnerable when we don't get our ideal sleep need, for example we may feel more emotional, crave unhealthy food and feel less motivated to exercise. The negative consequences are reversed when the cause of our temporary sleep disruption improves, or we learn how to improve our sleep.

If you don't get enough sleep, or mostly sleep longer than you think you should, it is important to address the issue by talking to a health care professional. After a period of three months, a sleep disturbance is considered chronic. This does not mean you should wait three months before seeking help. If you work in a safety critical role or spend a lot of time doing activities that are more susceptible to the effects of sleep loss (for example driving) you should speak to your manager, supervisor or a health care professional as soon as possible to get the support you need.

How does getting adequate sleep reduce our risk of illness?

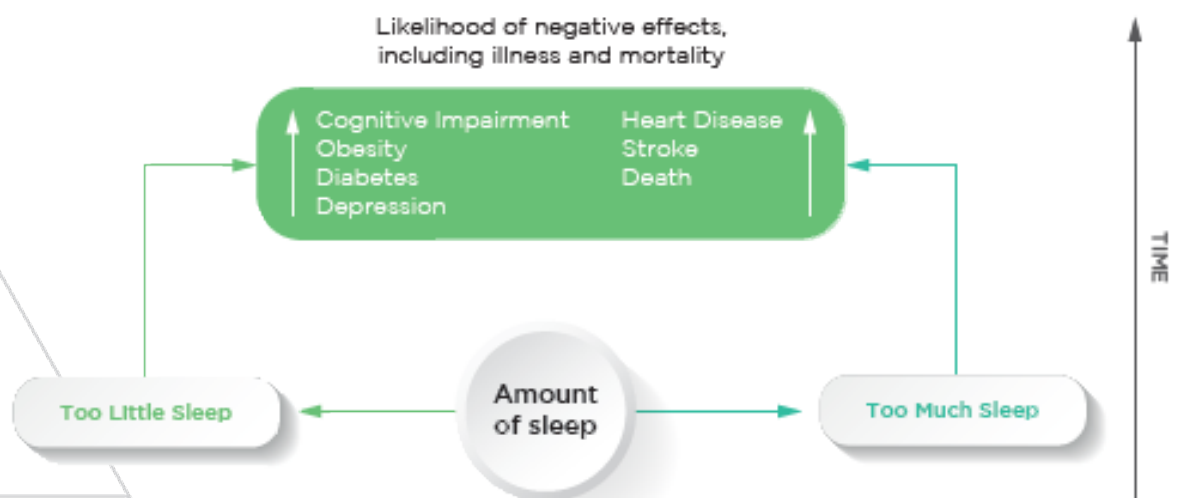


Figure 1: The relationship between sleep duration, illness and mortality.

Research suggests that getting enough sleep helps regulate appetite and energy intake and therefore protects us against the risk of obesity, diabetes and cardiovascular disease.

SLEEP REGULATES HOW HUNGRY AND FULL WE FEEL

Inadequate sleep is associated with a 55% increased likelihood of developing obesity³. Obtaining enough sleep maintains the balance of the hormones that control hunger (ghrelin) and feeling full (leptin). Ghrelin is a hormone produced by the stomach and leptin is a hormone produced by fat cells. When we haven't had enough sleep leptin decreases and ghrelin increases to stimulate hunger, energy intake and storage of fat cells. This is one reason we tend to crave foods high in fat and sugar, even after we've eaten enough calories (energy) in food or drink. Over time, this can lead to overeating and a higher body mass index (BMI) or even obesity³. Obesity is a risk factor for both type 2 diabetes and cardiovascular disease.⁶ As well as eating more calories, disrupted sleep can lead to eating at the wrong time of day; for example, compared to a meal eaten at 1:30pm, eating a meal at 1:30am results in higher blood glucose (sugar) levels, similar to pre-diabetic levels. Blood glucose is higher at night because the body's production and release of insulin, which regulates blood glucose, is reduced at night. By disrupting the regulation of blood glucose levels, inadequate sleep and sleeping at the wrong time over time can increase the risk of developing type 2 diabetes by 30%³. *What are the benefits of sleep for my physical health?*

SLEEP HELPS US TO MAKE HEALTHY FOOD CHOICES

Research has shown that when we haven't had enough sleep, the amygdala, a part of the brain that regulates emotion, is more active. When

we are sleep deprived and presented with high-calorie foods, such as chocolate, the amygdala is very reactive, and we are more likely to consume the food⁴. When we have adequate sleep, we are less likely to snack between meals, we eat more vegetables, and we eat less fatty food³. Shift workers are a group of people who are particularly likely to experience sleep loss. Shift workers can eat around the clock, and tend to consume more sugar, saturated fat, and sugars-sweetened drinks compared to non-shiftworkers⁵. The type of food that is available at work, and meal timing, therefore play key roles in determining the health status of shift workers.

SLEEP PROTECTS THE EFFECTIVENESS OF YOUR IMMUNE SYSTEM

The benefits of sleep for the immune system have been shown in studies of how the body reacts to vaccinations for flu and hepatitis A. Compared to people who did not have enough sleep before they were vaccinated, those people who had been sleeping well had a more effective antibody response to the vaccination^{6,7}.

Beauty sleep is real

We all know that we do not look our best when we are tired. Researchers have found that compared to sleeping only 4 hours per night for 2 nights, when people slept for their usual 7 to 9 hours, others judged them to be more alert, healthy and attractive. What's more, the judges said that they would be more willing to socialise with the people who had slept more. The bottom line is: if you are trying to be healthy and make a good impression, start with a good night's sleep.

Can I catch up on sleep at the weekend and reverse the negative effects of inadequate sleep?

The answer to this question is, sort of. Compensating for sleep loss during the working week by 'sleeping in' at the

weekend may reduce the risk of illness associated with regularly sleeping less than six hours¹. After a difficult project in the office, offshore trip, or at the end of a shift work pattern, it is common to have accumulated some sleep loss. Of course, it is necessary to take the time to recover and compensate by getting as much sleep as you can until you feel recovered.

However, research has shown that the change in the timing of sleep on weekdays versus the weekend causes 'social jetlag' and is not optimal for our health¹⁰. One of the key indicators of sleep health is the regularity of sleep and wake times. When we don't keep regular or routine sleep times, we are more likely to make unhealthy choices, which increases the likelihood of weight gain⁸.

Ideally, try and take steps to sleep more on workdays to reduce your need for recovery and improve your sleep health. If you work shifts, if possible, try to build some regularity in your sleep patterns around your schedule to minimise the sleep loss. When you do need to recover from sleep loss on the weekend or days off, try and sleep and wake at times that are similar to your ideal sleep times. For example, if your ideal sleep time is 11pm to 7am, try and recover by sleeping from 10pm to 8am.

What is sleep health?

'Sleep health' is not simply the absence of sleep problems, rather it emphasises the positive role of sleep in health. Instead of asking 'what is the impact of lack of sleep on my health?' we should ask 'how does sleep improve my health?'. This is a subtle but important difference.

How do I know if I have good sleep health?

Researchers have identified five markers of good sleep health known to contribute to optimal performance, physical and mental well-being. The acronym RU_SATED⁹ contains the six markers of sleep health:

1. **Regularity:** Wake up and fall asleep at about the same time (within one hour) every day.

2. **Satisfaction:** You are satisfied with your sleep.

3. **Alertness:** You stay awake all day without dozing.

4. **Timing:** Your sleep is in sync with the day and night cycle.

5. **Efficiency:** You easily fall asleep, and then stay asleep.

6. **Duration:** You get the individual amount of sleep you need each day.

To what extent are these markers of good sleep health true for your own sleep? Your answer will depend on your work schedule. If you work at night, the timing of your sleep is not in sync with the day/night cycle. However, over the years you may have developed some strategies that allow you to sleep well during the day before working at night, or sleep well again during the night after a period of night work. In this respect, you may feel that you are getting the sleep you need, and you have good sleep health.

The RU_SATED model can be used as a tool to identify whether there are things you could do to improve your sleep health. The markers are interlinked, so you may be able to make one change that benefits many of the markers of good sleep health – for example, removing your mobile phone from the bedroom could benefit all of them.

To Summarise

Sleep is of paramount importance for our physical health because it affects our lifespan and vulnerability to illness. Catching up on sleep at the weekend can help us to compensate for sleep loss in the week, but it is not an optimal solution. To maintain good sleep health, as much as your work schedule will allow, try and go to sleep and wake at similar times and try to get more sleep every night to limit your need for extended recovery sleep on the weekend. Not only does a good night's sleep help you be healthy, it also helps you make a better impression.

What should I read next?

In our 24/7 society, many of us experience sleep loss due to factors including light at night, e.g. use of smartphones and shift work. We have created a series of information sheets on the benefits of maintaining good sleep health, and strategies for achieving this. To gain more understanding of the impact of sleep on your mental health, read the information sheet titled 'What are the benefits of sleep for my mood?'¹

References

1. Åkerstedt, T., Ghilotti, F., Grotta, A., Zhao, H., Adami, H. O., Trolle-Lagerros, Y., & Bellocco, R. (2018). Sleep duration and mortality—Does weekend sleep matter? *Journal of Sleep Research*, e12712.
2. Kripke, D. F., Garfinkel, L., Wingard, D. L., Klauber, M. R., & Marler, M. R. (2002). Mortality associated with sleep duration and insomnia. *Archives of general psychiatry*, 59(2), 131-136.
3. Grandner, M. A. (2018). The cost of sleep lost: implications for health, performance, and the bottom line. *American Journal of health Promotion*. 1629-1634.
4. Greer, S. M., Goldstein, A. N., & Walker, M. P. (2013). The impact of sleep deprivation on food desire in the human brain. *Nature communications*, 4, 2259.
5. Gibson, R. (2018). Working hours and cardiometabolic health—an emerging area of nutritional research. *Nutrition Bulletin*, 43(3), 255-261.
6. Spiegel, K., Sheridan, J. F., & Van Cauter, E. (2002). Effect of sleep deprivation on response to immunization. *JAMA*, 288(12), 1471-1472.
7. Lange, T., Perras, B., Fehm, H. L., & Born, J. (2003). Sleep enhances the human antibody response to hepatitis A vaccination. *Psychosomatic medicine*, 65(5), 831-835.
8. Parsons, M. J., Moffitt, T. E., Gregory, A. M., Goldman-Mellor, S., Nolan, P. M., Poulton, R., & Caspi, A. (2015). Social jetlag, obesity and metabolic disorder: investigation in a cohort study. *International Journal of Obesity*, 39(5), 842.
9. Buysse, D. J. (2014). Sleep health: Can we define it? Does it matter? *Sleep*, 37(1), 9-17.
10. Ruscitto, C., Holmes, A., & Booth, S. (2019). What is social jetlag? London. Available at: <https://www.bainessimmons.com>
11. Ruscitto, C., Holmes, A., & Booth, S. (2019). What are the benefits of sleep for my mood? London. Available at: <https://www.bainessimmons.com>

About the Author

Cristina Ruscitto SENIOR RESEARCHER

Dr Cristina Ruscitto is a Senior Researcher at Baines Simmons. She specialises in the psycho-behavioural predictors of jetlag and fatigue in the aviation sector. Her role involves fatigue management training, the development of fatigue surveys and survey analysis, the scientific study of roster patterns to quantify fatigue risk as well as writing evidence-based recommendations to improve sleep in different operational settings.

Cristina joined Baines Simmons in April 2018, having previously completed her PhD in Health Psychology exploring the psycho-behavioural predictors of jetlag amongst long-haul cabin crew at the University of Surrey, UK. Her research examined the relationship between subjective (symptom perception) and objective (shift in melatonin acrophase) jetlag in order to provide a comprehensive account of jetlag in long-haul cabin crew. The nature of subjective jetlag was further explored in terms of how long-haul crew make sense of jetlag and how this affects their adaptation to jetlag. Finally, based on recent evidence about the circadian resetting properties of food timing, Cristina also evaluated the impact of mealtimes for reducing jetlag in long-haul crew.

Cristina's interest in the field of jetlag and fatigue in aviation is not only academic but also personal having worked as long-haul cabin crew for 24 years. Cristina also works as a Visiting Researcher and Academic Tutor in Psychology for the University of Surrey. She is a Chartered member of the British Psychological Society and an Associate Fellow of the Higher Education Academy.

About Baines Simmons

We are specialists in aviation regulations, compliance and safety management and partner with the world's leading civil and defence aviation organisations to improve safety performance.

As trusted advisors to business, armed forces, governments and regulators across all sectors of aviation, we help to advance best practice, shape safety thinking and drive continuous improvement to safety performance through our consulting, training and outsourced services.